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Wed-Mo-Po.04-07: Empowering the 2G-HTS Tape Industry: SuperMag's Progress on Production and Research

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Due to the rapid development of compact nuclear fusion devices, the industrialization of second-generation high-temperature superconducting tapes (2G-HTS) have entered a new historical phase. SuperMag Technology (Shanghai) Ltd, a spin-off from Shanghai Jiao Tong University, has swiftly established at the end of 2022 as an manufacturer dedicated to cost-effective 2G-HTS tapes. After two years of development, SuperMag has demonstrated serval remarkable progress in R&D and manufacturing capabilities. Firstly, for the Hastelloy substrate, we successfully integrate an industrializable, low-cost mechanical polishing process, which significantly enhance the fault tolerance of electro-polishing and reduces multi-scale defects. As a result, Ic homogeneity is significantly enhanced and Ic drops are also remarkably reduced. Secondly, by improving deposition process and film composition, we achieved a milestone of an Ic value exceeding 200 A-4 mm (77 K, self-field), with an annual production capacity of over 1800 km/year. Last but not least, we have developed a highly customized post-treatment process tailored to our customers' specific application scenarios. We have applied diverse post-treatment processes to provide customized HTS-tape solutions for our clients.

Authors: JIANG, Guangyu (SuperMag Technology (Shanghai) Ltd.); Dr WU, Yue (Shanghai Jiaotong University); ZHAO, Yue (shanghai jiao tong university)

Presenter: JIANG, Guangyu (SuperMag Technology (Shanghai) Ltd.)

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